

CLAIMS

What is claimed is:

1. A method of fabricating a substantially hermetic package, comprising:  
placing at least one semiconductor device with a surface thereof in a horizontal plane;  
recognizing a location and orientation of said surface of said at least one semiconductor device;  
and  
stereolithographically fabricating a substantially hermetic package on said surface of said at least one semiconductor device, said substantially hermetic package comprising at least one layer of at least partially consolidated hermetic packaging material.
2. The method of claim 1, further comprising storing data including at least one physical parameter of said at least one semiconductor device and of said substantially hermetic package in computer memory, and using the stored data in conjunction with a machine vision system to recognize a location and orientation of said at least one semiconductor device.
3. The method of claim 2, further comprising using the stored data, in conjunction with said machine vision system, to effect said stereolithographically fabricating.
4. The method of claim 1, further including securing said at least semiconductor device to a carrier prior to placing the surface of the at least one semiconductor device in said horizontal plane.
5. The method of claim 1, further comprising:  
flipping said at least one semiconductor device; and  
stereolithographically fabricating at least one additional layer of said substantially hermetic package on another surface of said at least one semiconductor device.

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6. The method of claim 5, wherein said stereolithographically fabricating said at least one additional layer comprises securing said at least one additional layer to a previously formed layer of said substantially hermetic package.

7. The method of claim 6, wherein said securing said at least one layer to said previously formed layer of said substantially hermetic package comprises substantially encapsulating said at least one semiconductor device.

8. The method of claim 1, wherein said stereolithographically fabricating comprises: forming a layer of unconsolidated hermetic packaging material; at least partially selectively consolidating said hermetic packaging material of said layer in selected regions; and repeating said forming said layer and said at least partially selectively consolidating until all surfaces of the at least one semiconductor device are substantially covered with at least partially consolidated hermetic packaging material.

9. The method of claim 1, wherein said stereolithographically fabricating comprises: providing a sheet of hermetic packaging material; and defining at least boundaries of a corresponding, first layer of the substantially hermetic package in said sheet.

10. The method of claim 9, wherein said stereolithographically fabricating further comprises: providing at least one additional sheet of hermetic packaging material; and defining at least boundaries of an additional, corresponding layer of the substantially hermetic package in said sheet.

11. The method of claim 9, wherein said defining comprises laser-cutting.

Summary

12. The method of claim 9, wherein said providing said sheet comprises providing a sheet of thermoplastic glass.

13. The method of claim 1, wherein said stereolithographically fabricating is effected until said at least one semiconductor device is substantially encapsulated by hermetic packaging material.

14. The method of claim 1, wherein said placing comprises placing an assembly including at least one semiconductor die and at least one carrier substrate in said horizontal plane.

15. The method of claim 1, wherein said placing comprises placing an assembly including at least one semiconductor die and at least one lead frame in said horizontal plane.

16. The method of claim 1, wherein said placing comprises placing at least one substantially bare semiconductor die in said horizontal plane.

17. The method of claim 16, wherein said placing said at least one substantially bare semiconductor die comprises placing a semiconductor substrate bearing a plurality of substantially bare semiconductor dice locations in said horizontal plane.

18. The method of claim 17, wherein said stereolithographically fabricating is effected on a first side of said semiconductor substrate, said hermetic packaging material substantially covering said first side of said semiconductor substrate.

19. The method of claim 18, further comprising inverting said semiconductor substrate and removing material of said semiconductor substrate between adjacent semiconductor dice at least down to said hermetic packaging material, said hermetic packaging material maintaining positions of said adjacent semiconductor dice.

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20. The method of claim 19, wherein said removing comprises sawing said semiconductor substrate along streets located between said adjacent semiconductor dice.

21. The method of claim 19, wherein said removing comprises etching said semiconductor substrate along streets located between said adjacent semiconductor dice.

22. The method of claim 19, further comprising:  
disposing at least partially consolidated hermetic packaging material between said adjacent semiconductor dice and on an active surface of each of said semiconductor dice to form a plurality of substantially hermetically packaged semiconductor dice.

23. The method of claim 22, further comprising:  
singulating at least some of said plurality of substantially hermetically packaged semiconductor dice from said semiconductor substrate.

24. The method of claim 22, further comprising:  
exposing at least one bond pad on said active surface of at least one of said plurality of substantially hermetically packaged semiconductor dice.

25. The method of claim 24, wherein said exposing comprises etching a region of said at least partially consolidated hermetic packaging material located above said at least one bond pad.

26. The method of claim 24, further comprising:  
fabricating at least one conductive trace on said substantially hermetic package and in communication with said at least one bond pad.